FINAL

# Office of River Protection
# Consent Decree 08-5085-FVS

# Monthly Summary Report

# November 2015

**Office of River Protection**

**Consent Decree 08-5085-FVS**
**Monthly Summary Report**

**November 2015 (Monthly Summary Report/Project Earned Value Management System reflects September 2015 information)**

## CD Milestone Statistics/Status

| Milestone | Title | Due Date | Completion Date | Status |
|---|---|---|---|---|
| **Fiscal Year 2014** | | | | |
| D-00B-01 | Complete Retrieval of Tank Waste from 10 SSTs in WMA-C | 09/30/2014 | | Past Due |
| D-00B-02 | Advise Ecology of the Nine SSTs Waste will be Retrieved by 2022 | 09/30/2014 | 08/24/2011 | Completed |
| **Fiscal Year 2015** | | | | |
| D-00A-07 | LAW Facility Construction Substantially Complete | 12/31/2014 | | Past Due |
| D-00A-19 | Complete elevation 98 feet Concrete Floor Slab Placements in PT Facility | 12/31/2014 | | Past Due |
| **Fiscal Year 2016** | | | | |
| D-00A-13 | Complete Installation of Pretreatment Feed Separation Vessels | 12/31/2015 | | Ongoing |
| **Fiscal Year 2017** | | | | |
| D-00A-02 | HLW Facility Construction Substantially Complete | 12/31/2016 | | Ongoing |

CD = Consent Decree.
Ecology = Washington State Department of Ecology.
HLW = high-level waste.
LAW = low-activity waste.
PT = pretreatment.
SST = single-shell tank.
WMA-C = C Farm waste management area.

## Consent Decree Reports/Reviews

**D-00C-01 series, Submit to State of Washington and State of Oregon Semi-Annual Report**, Due: Semiannually – January 31 and July 31 of each year, Status: Ongoing. The July 2015 Semiannual Report was issued on July 31, 2015, via U.S. Department of Energy (DOE), Office of River Protection (ORP) letter 15-ECD-0037, "July 2015 Semi-Annual Report for State of Washington vs. U.S. Department of Energy, Case No. 08-5085-FVS, for Waste Treatment and Immobilization Plant Construction and Startup Activities and Tank Retrieval Activities – November 1, 2014, thorough April 30, 2015."

**D-00C-02 series, Submit to State of Washington and State of Oregon Monthly Summary Reports**, Due: End of each month, Status: Ongoing.

**D-006-00-B1, Provide State of Oregon notice of meetings in D-006-00-B, etc. no less than 30 days before they are scheduled**, Due: September 25, 2016, Status: On Schedule.

**D-006-00-B, Meet Approximately Every Three Years after Entry of Decree to review requirements of the Consent Decree**, Due: October 25, 2016, Status: On Schedule.

## Single-Shell Tank Retrieval Program

| Milestone | Title | Due Date | Status |
|---|---|---|---|
| D-00B-01 | Complete Retrieval of Tank Wastes from 10 Remaining SSTs in WMA-C | September 30, 2014 | Past Due |
| D-00B-01A through D-00B-01J | Submit Tank Retrieval Complete Certification | One year following each retrieved tank retrieval completion report[a] | Ongoing |
| D-00B-02 | Advise Ecology of the Nine SSTs from which Waste Will Be Retrieved by 2022 | September 30, 2014 | Completed |
| D-00B-03 | Initiate Startup of Retrieval in At Least 5 of 9 SSTs in D-00B-02 | December 31, 2017 | Ongoing* |
| D-00B-04 | Complete Retrieval of Tank Wastes from the nine SSTs in D-00B-02 | September 30, 2022 | Ongoing* |
| D-00B-04A through D-00B-04I | Submit Tank Retrieval Complete Certification | TBD | TBD |

a. Pursuant to Section IV-B-5 of the Consent Decree, the U.S. Department of Energy (DOE) must submit to the Washington State Department of Ecology (Ecology) a written certification that DOE has completed retrieval of a tank in accordance with the requirements of Appendix C, Part 1, of the Consent Decree.
Completed for Single-Shell Tank (SST) C-104 on March 21, 2013, via DOE Office of River Protection (ORP) letter 13-TF-0018. Completed for SST C-108 on May 1, 2013, via ORP letter 13-TF-0025. Completed for SST C-109 on June 4, 2013, via ORP letter 13-TF-0037. Completed for SST C-110 on January 29, 2014, via ORP letter 14-TF-0007. Completed for SST C-107 on September 30, 2014, via ORP letter 14-TF-0114. Completed for SST C-112 on September 30, 2014, via ORP letter 14-TF-0115.

SST = single-shell tank.
TBD = to be determined.
WMA-C = C Farm waste management area.

**Significant Past Accomplishments:**

- Received approval to forego a third retrieval technology in Tank 241-C-102 from the Washington State Department of Ecology (Ecology).
- Continued operation of Tank 241-C-105 Mobile Arm Retrieval System – Vacuum (MARS- V) retrieval system using high-pressure water, volume retrieved is approximately 45 percent.

- Completed extended reach sluicers system (ERSS) installation and operational testing in preparation for restarting retrieval operations at Tank 241-C-111.

**Significant Planned Activities in the Next Six Months:**

- Finish a Tank 241-C-105 systems engineering evaluation of the current retrieval method; will potentially need a revised tank waste retrieval work plan due to recent MARS-V failure.
- Begin startup of hard heel retrieval in Tank 241-C-111 using high-pressure water, with caustic/water dissolution in early October 2015.

**Issues:**

*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone.

## Tank Waste Retrieval Work Plan Status

| Tank | TWRWP | Expected Revisions | First Retrieval Technology | Second Technology | Third Technology |
|---|---|---|---|---|---|
| C-101 | RPP-22520, Rev. 8 | Complete | Modified Sluicing with ERSS | High-Pressure Water deployed with the ERSS | - |
| C-102 | RPP-22393, Rev. 7 | Complete | Modified Sluicing with ERSS | High-Pressure Water deployed with the ERSS | - |
| C-104 | RPP-22393, Rev. 7 | Complete | Modified Sluicing | Chemical Retrieval Process complete per 13-TF-0018 | - |
| C-105 | RPP-22520, Rev. 8 | Complete | MARS-V | MARS-V-High Pressure Water Spray | - |
| C-107 | RPP-22393, Rev. 7 | Complete | MARS-S | MARS-S-High Pressure Water Spray | Water Dissolution |
| C-108 | RPP-22393, Rev. 7 | Complete | Modified Sluicing | Chemical Retrieval Process complete per 13-TF-0025 | - |
| C-109 | RPP-21895, Rev. 5 | Complete | Modified Sluicing | Chemical Retrieval Process complete per 13-TF-0037 | - |
| C-110 | RPP-33116, Rev. 3 | Complete | Modified Sluicing | Mechanical Waste Conditioning with an In-Tank Vehicle | High Pressure Water |

| Tank | TWRWP | Expected Revisions | First Retrieval Technology | Second Technology | Third Technology |
|---|---|---|---|---|---|
| C-111 | RPP-37739, Rev. 2 | Complete | Modified Sluicing | High pressure water using the ERSS | Chemical Dissolution Process with ERSS |
| C-112 | RPP-22393, Rev. 7 | Complete | Modified Sluicing | Chemical Retrieval Process | - |

ERSS = extended reach sluicing system.
MARS = Mobile Arm Retrieval System.
S = sluicing.
TWRWP = Tank Waste Retrieval Work Plan.
V = vacuum.

**Significant Accomplishments:**

None.

**Significant Planned Activities in the Next Six Months:**

- Finalize AX-Farm TWRWP.

**Issues:**

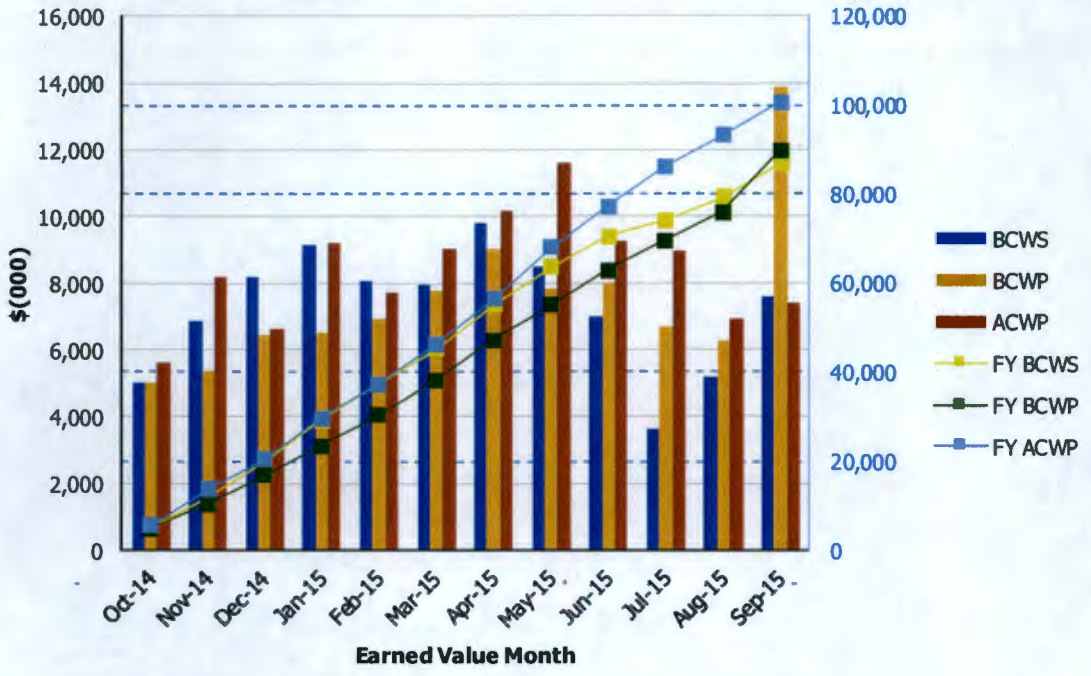
None.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data September-15

**Tank Farms ORP-0014**
**Retrieve and Close SST's 5.02**

EVMS Monthly and Fiscal Year Values




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $5,024 | $5,011 | $5,609 | 1.00 | 0.89 | $5,024 | $5,011 | $5,609 | 1.00 | 0.89 |
| Nov 2014 | $6,852 | $5,392 | $8,174 | 0.79 | 0.66 | $11,876 | $10,403 | $13,783 | 0.88 | 0.75 |
| Dec 2014 | $8,171 | $6,453 | $6,612 | 0.79 | 0.98 | $20,047 | $16,856 | $20,395 | 0.84 | 0.83 |
| Jan 2015 | $9,167 | $6,524 | $9,195 | 0.71 | 0.71 | $29,214 | $23,380 | $29,589 | 0.80 | 0.79 |
| Feb 2015 | $8,075 | $6,924 | $7,719 | 0.86 | 0.90 | $37,290 | $30,304 | $37,309 | 0.81 | 0.81 |
| Mar 2015 | $7,971 | $7,801 | $9,009 | 0.98 | 0.87 | $45,261 | $38,105 | $46,318 | 0.84 | 0.82 |
| Apr 2015 | $9,818 | $9,019 | $10,148 | 0.92 | 0.89 | $55,079 | $47,124 | $56,466 | 0.86 | 0.83 |
| May 2015 | $8,474 | $7,830 | $11,613 | 0.92 | 0.67 | $63,553 | $54,954 | $68,079 | 0.86 | 0.81 |
| Jun 2015 | $6,981 | $8,021 | $9,247 | 1.15 | 0.87 | $70,534 | $62,976 | $77,326 | 0.89 | 0.81 |
| Jul 2015 | $3,666 | $6,714 | $8,983 | 1.83 | 0.75 | $74,199 | $69,690 | $86,309 | 0.94 | 0.81 |
| Aug 2015 | $5,201 | $6,256 | $6,916 | 1.20 | 0.90 | $79,400 | $75,946 | $93,225 | 0.96 | 0.81 |
| Sep 2015 | $7,578 | $13,863 | $7,404 | 1.83 | 1.87 | $86,979 | $89,809 | $100,629 | 1.03 | 0.89 |
| CTD | $592,478 | $585,227 | $609,972 | 0.99 | 0.96 | | | | | |

ACWP = actual cost of work performed.
BCWS = budgeted cost of work scheduled.
BCWP = budgeted cost of work performed.
CPI = cost performance index.
EVMS = earned value management system.
FY = fiscal year.
SPI = schedule performance index.

***Retrieve and Close Single-Shell Tanks***

The current month favorable schedule variance (SV) of $6,285K is due to:

- The remaining performance taken on the MARS-V due to an end effector hose leak that permanently shut down this retrieval system for Tank-241-C-105.

The current month favorable cost variance (CV) of $6,477K is due to:

- Performance was claimed with minimal costs due to the permanent shut down of the MARS-V due to an end effector hose leak.

## Waste Treatment and Immobilization Plant Project

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-06 | Complete Methods Validations | 12/31/2017 | Ongoing* |
| D-00A-17 | Hot Start of Waste Treatment Plant | 12/31/2019 | Ongoing* |
| D-00A-01 | Achieve Initial Plant Operations for WTP | 12/31/2022 | Ongoing* |

WTP = Waste Treatment and Immobilization Plant.

The Waste Treatment and Immobilization Plant (WTP) Project currently employs approximately 2,874 full-time equivalent contractor (Bechtel National, Inc. [BNI]) and subcontractor personnel. This includes 627 craft, 419 non-manual, and 146 subcontractor full-time equivalent personnel working at the WTP construction site (all facilities).

In October 2012, the percent-complete values for Pretreatment (PT) and High-Level Waste (HLW) facilities were frozen at the September 2012 rate. Construction, procurement, and production engineering activities were placed on hold for PTF and significantly slowed down for HLW. In August 2014, the U.S. Department of Energy (DOE) approved continuation of production engineering activities for HLW. Subsequently, DOE has approved the fiscal year (FY) 2015 and FY 2016 2-Year Interim Work Plan. In April 2015, a 3-Year Interim Work Plan for the PT Facility was implemented emphasizing prioritization of technical issue resolution activities. The WTP Project is focused on resolving PT Facility technical issues and finalizing HLW Facility design.

The WTP Project continues to focus on completion of the Low-Activity Waste (LAW) Facility, Analytical Laboratory (LAB), and Balance of Facilities (BOF) (collectively LBL). As of September 2015, LBL facilities were 50 percent complete, design and engineering was 78 percent complete, procurement was 71 percent complete, construction was 79 percent complete, and startup and commissioning was 8 percent complete.

In September 2015, the cumulative to-date WTP Project schedule variance was a negative $20.2 million, and the cumulative to-date WTP Project cost variance was a positive $61.7 million. The cumulative to-date cost and schedule variance is based on the progress of the LBL internal forecast.

The following is the project status through the end of September 2015.

**Significant Past Accomplishments:**

- Completed multi-discipline review of Effluent Management Facility (EMF) design (BOF)
- Issued the direct-feed LAW (DFLAW) Basis of Design Change Notice (BOF)
- Completed melter 1 internal structural reinforcement welding (LAW)
- Completed one concrete placement (wall 4104) (HLW)
- Installed 17.2 tons of structural steel (HLW)
- Issued PT T2 Criticality Calculation Report (PT)

**Significant Planned Actions in the Next Six Months:**

- Receive caustic scrubber (LAW)
- Assemble and install wet electrostatic precipitator internals (LAW)
- Receive the thermal catalytic oxidizer (TCO) and ammonia skid
- Complete EMF Preliminary Documented Safety Analysis (PDSA) (BOF)
- Begin excavation for EMF (BOF)
- Complete site energization from permanent power supply (BOF)
- Begin LAB system walk downs in support of DFLAW modifications (LAB)
- Begin full scale high-efficiency particulate air (HEPA) filter testing in accordance with the HEPA Filter Test Plan at the Mississippi State University facility (HLW)
- Initiate HLW melter off-gas treatment process/process vessel vent (HOP/PVV) design study (HLW)
- Complete criticality safety evaluation engineering study for ultrafiltration process system (UFP)/HLW lag storage and feed blending process (HLP)/plant wash and disposal system (PWD) with controls (PT)
- Complete hydrogen control strategy gap analysis (engineering study includes gap analysis and post design basis event [DBE] ventilation and air requirements) (PT).

**Issues:**

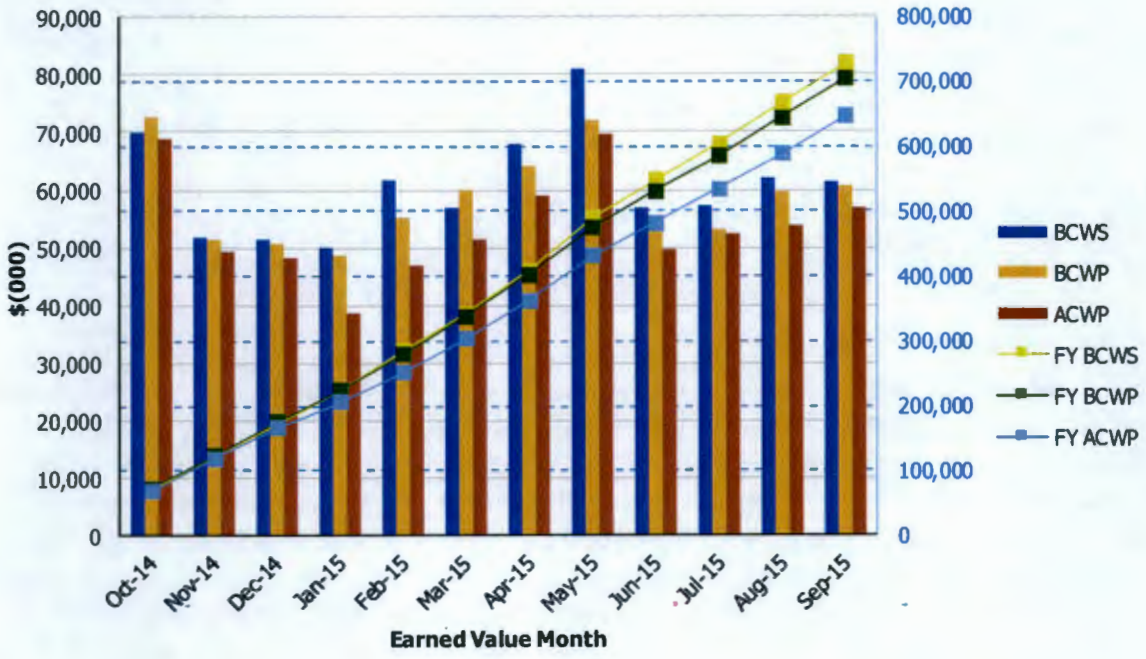
*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to WTP include, among others, pulse-jet mixers (PJM), corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 201

**River Protection Project**
**Waste Treatment Plant (WTP) Project**

EVMS Monthly and Fiscal Year Values




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $69,893 | $72,879 | $69,039 | 1.04 | 1.06 | $69,893 | $72,879 | $69,039 | 1.04 | 1.06 |
| Nov 2014 | $51,713 | $51,323 | $49,300 | 0.99 | 1.04 | $121,606 | $124,202 | $118,339 | 1.02 | 1.05 |
| Dec 2014 | $51,573 | $50,885 | $48,245 | 0.99 | 1.05 | $173,179 | $175,087 | $166,583 | 1.01 | 1.05 |
| Jan 2015 | $50,143 | $48,696 | $38,818 | 0.97 | 1.25 | $223,323 | $223,783 | $205,401 | 1.00 | 1.09 |
| Feb 2015 | $61,729 | $55,235 | $46,859 | 0.89 | 1.18 | $285,052 | $279,018 | $252,260 | 0.98 | 1.11 |
| Mar 2015 | $56,799 | $59,925 | $51,563 | 1.06 | 1.16 | $341,850 | $338,942 | $303,823 | 0.99 | 1.12 |
| Apr 2015 | $67,809 | $64,010 | $58,892 | 0.94 | 1.09 | $409,659 | $402,952 | $362,716 | 0.98 | 1.11 |
| May 2015 | $80,875 | $72,114 | $69,468 | 0.89 | 1.04 | $490,534 | $475,066 | $432,184 | 0.97 | 1.10 |
| Jun 2015 | $56,972 | $55,423 | $49,685 | 0.97 | 1.12 | $547,506 | $530,489 | $481,869 | 0.97 | 1.10 |
| Jul 2015 | $57,131 | $53,298 | $52,407 | 0.93 | 1.02 | $604,637 | $583,787 | $534,276 | 0.97 | 1.09 |
| Aug 2015 | $62,130 | $59,762 | $53,793 | 0.96 | 1.11 | $666,767 | $643,549 | $588,069 | 0.97 | 1.09 |
| Sep 2015 | $61,517 | $60,659 | $56,948 | 0.99 | 1.07 | $728,284 | $704,208 | $645,017 | 0.97 | 1.09 |
| PTD | $9,099,763 | $9,079,546 | $9,017,802 | 1.00 | 1.01 | | | | | |

ACWP = actual cost of work performed.
BCWS = budgeted cost of work scheduled.
BCWP = budgeted cost of work performed.
CPI = cost performance index.
EVMS = earned value management system.
FY = fiscal year.
SPI = schedule performance index.

## Pretreatment Facility

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-19 | Complete Elevation 98' Concrete Floor Slab in PT Facility | 12/31/2014 | Past Due |
| D-00A-13 | Complete Installation of Pretreatment Feed Separation Vessels | 12/31/2015 | Ongoing* |
| D-00A-14 | PT Facility Construction Substantially Complete | 12/31/2017 | Ongoing* |
| D-00A-15 | Start PT Facility Cold Commissioning | 12/31/2018 | Ongoing* |
| D-00A-16 | PT Facility Hot Commissioning Complete | 12/31/2019 | Ongoing* |

PT = pretreatment.

The PT will separate radioactive tank waste into HLW and LAW fractions, and transfer each waste type to the respective vitrification facility for immobilization. As of September 2012, the PT Facility was 56 percent complete overall, with engineering design 85 percent complete, procurement 56 percent complete, construction 43 percent complete, and startup and commissioning 3 percent complete. Construction, procurement, and production engineering activities remain on hold, resulting in no change to the percent-complete status since September 2012. BNI and DOE continue to focus on resolving technical issues, performing hazard analyses, and completing safety evaluations for process systems in accordance with the revised PT Facility 3-Y Interim Work Plan

BNI has submitted resolution plans for eight technical issues: T1, Hydrogen in Vessels; T2, Criticality; T3, Hydrogen in Piping and Ancillary Vessels (HPAV); T4, Mixing; T5, Erosion Corrosion; T6, PT Facility Optimization; T7, Vessel Analysis; and T8, Ventilation. Phase 1 of the Full-Scale Vessel Testing is continuing for the PJM controls utilizing the RLD-8T vessel. Technical review teams continue to evaluate open PT Facility technical issues. An evaluation is ongoing relative to a standardized design for high-solids vessels within the PT Facility. With primary emphasis on design and fabrication of hold point releases supporting procurement, fabrication and delivery of the standardized high solids vessel design (SHSVD)-T16ft vessel.

**Significant Past Accomplishments:**

- Issued PT T2 Criticality Calculation Report (PT)
- Completed first Phase 2 test
- Completed SHSVD info testing and identify design features
- Started PJM fabrication

**Significant Planned Actions in the Next Six Months:**

- Complete criticality safety evaluation engineering study for UFP/HLP/PWD with controls

- Complete hydrogen control strategy gap analysis (engineering study includes gap analysis and post DBE ventilation and air requirements)
- Receive technical issue closure work packages T1 and T3
- Issue Phase 2 PJM controls study
- Complete sliding bed evaluation report and brief DOE Office of River Protection (ORP)
- Issue SHSVD Design Verification Guide

**Issues:**

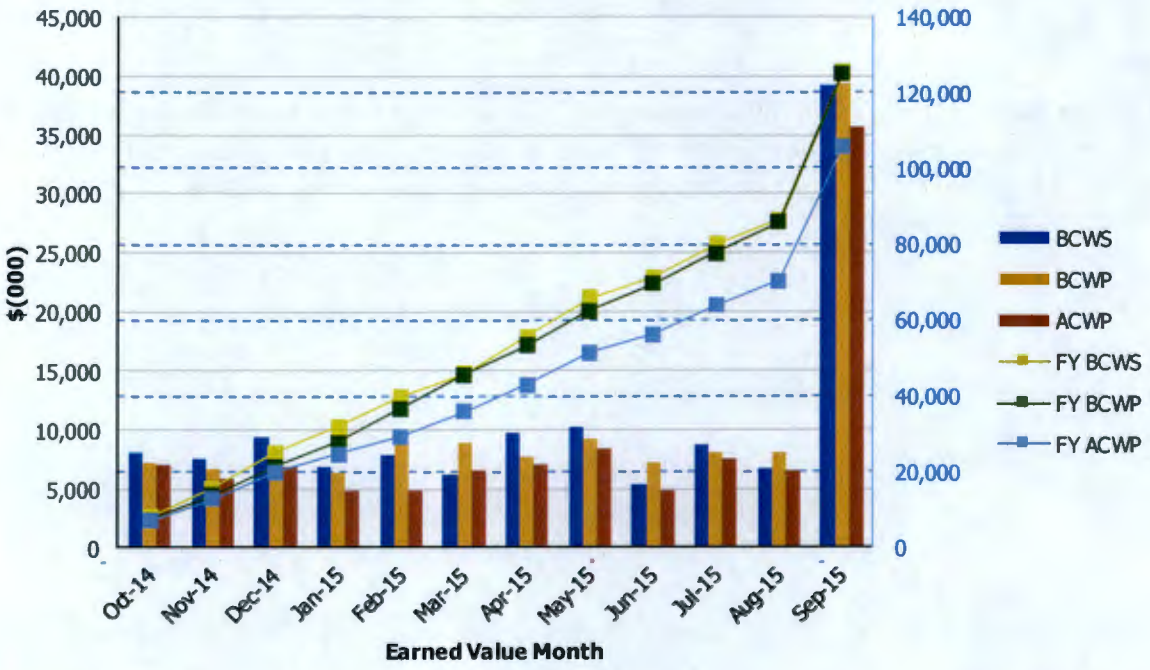
*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to WTP include, among others, PJMs, corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 2015

**River Protection Project**
**Pretreatment Facility (WBS 1.01)**

EVMS Monthly and Fiscal Year Values




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $8,100 | $7,285 | $7,050 | 0.90 | 1.03 | $8,100 | $7,285 | $7,050 | 0.90 | 1.03 |
| Nov 2014 | $7,582 | $6,657 | $5,917 | 0.88 | 1.13 | $15,682 | $13,942 | $12,967 | 0.89 | 1.08 |
| Dec 2014 | $9,361 | $7,472 | $6,841 | 0.80 | 1.09 | $25,043 | $21,414 | $19,808 | 0.86 | 1.08 |
| Jan 2015 | $6,819 | $6,293 | $4,765 | 0.92 | 1.32 | $31,862 | $27,707 | $24,574 | 0.87 | 1.13 |
| Feb 2015 | $7,877 | $9,034 | $4,869 | 1.15 | 1.86 | $39,740 | $36,742 | $29,442 | 0.92 | 1.25 |
| Mar 2015 | $6,180 | $8,917 | $6,567 | 1.44 | 1.36 | $45,920 | $45,659 | $36,009 | 0.99 | 1.27 |
| Apr 2015 | $9,661 | $7,631 | $7,008 | 0.79 | 1.09 | $55,581 | $53,290 | $43,017 | 0.96 | 1.24 |
| May 2015 | $10,243 | $9,161 | $8,322 | 0.89 | 1.10 | $65,823 | $62,451 | $51,340 | 0.95 | 1.22 |
| Jun 2015 | $5,406 | $7,122 | $4,769 | 1.32 | 1.49 | $71,229 | $69,573 | $56,109 | 0.98 | 1.24 |
| Jul 2015 | $8,740 | $8,112 | $7,602 | 0.93 | 1.07 | $79,970 | $77,685 | $63,710 | 0.97 | 1.22 |
| Aug 2015 | $6,613 | $8,122 | $6,608 | 1.23 | 1.23 | $86,583 | $85,808 | $70,318 | 0.99 | 1.22 |
| Sep 2015 | $39,146 | $39,406 | $35,615 | 1.01 | 1.11 | $125,729 | $125,214 | $105,933 | 1.00 | 1.18 |
| PTD | $1,732,400 | $1,731,832 | $1,712,560 | 1.00 | 1.01 | | | | | |

ACWP = actual cost of work performed.
BCWS = budgeted cost of work scheduled.
BCWP = budgeted cost of work performed.
CPI = cost performance index.
EVMS = earned value management system.
FY = fiscal year.
SPI = schedule performance index.

## High-Level Waste Facility

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-21 | Complete Construction of Structural Steel to 37' in HLW Facility | 12/31/2012 | Complete |
| D-00A-02 | HLW Facility Construction Substantially Complete | 12/31/2016 | Ongoing* |
| D-00A-03 | Start HLW Facility Cold Commissioning | 6/30/2018 | Ongoing* |
| D-00A-04 | HLW Facility Hot Commissioning Complete | 12/31/2019 | Ongoing* |

HLW = high-level waste.

The HLW Facility will receive the separated HLW concentrate from the PT Facility. This concentrate will be blended with glass formers, converted into molten glass in one of the two HLW melters, and then poured into cylindrical stainless steel canisters. After cooling, the canisters will be sealed and decontaminated before shipping to interim storage.

As of September 2012, the HLW Facility was 62 percent complete overall, with engineering design 89 percent complete, procurement 81 percent complete, construction 43 percent complete, and startup and commissioning 4 percent complete. Construction, procurement, and production engineering activities have been significantly slowed down, resulting in minimal change to the percent completion status since September 2012.

Currently, all activities are being performed in accordance with the FY 2015/FY 2016 2-Year Work Plan. Efforts are focused on completing activities required to obtain full production authorization by DOE. Limited construction is continuing with the concrete placements, installation of support steel, and crane rails in the canister decontamination cave and melter cave.

To support construction, engineering continues to execute detailed evaluations of structural supports for future installation of heating, ventilation, and air-conditioning (HVAC); fire protection; process piping; and electrical commodities. Design activities are focused to support safety design strategy gap analysis, technical core team recommendations, and engineering study development to resolve design and operability reviews. Studies are being performed to determine the ventilation system capability, waste handling capability, etc. One such study, the Personnel Access Door Study, which analyzed the system's ability to maintain cascade ventilation during operations has been issued. Hazard and accident analyses are ongoing to support the Preliminary Documented Safety Analysis (PDSA) update to align design and the safety basis.

Systems Engineering continues to implement the Systems Engineering Management Plan. The development of the emergency turbine generator system (ETX) system design description continues.

Preliminary testing has begun to support design and qualification of ventilation and off gas system high-efficiency particulate air (HEPA) filters. Multiple filter media designs are being

tested to ensure that the qualified filters support the needs for HLW and LBL facilities. Fabrication of full scale test filters has begun.

Design is progressing for radioactive liquid waste disposal (RLD) vessels 7 and 8. PDSA change packages for these vessel designs have been submitted to DOE for approval and comment resolution is ongoing

**Significant Past Accomplishments:**

- Continued HEPA filter testing in accordance with the HEPA Filter Test Plan at the Mississippi State University facility
- Began fabrication of full scale HEPA test filters
- Completed one concrete placement (wall 4104)
- Installed 17.2 tons of structural steel
- Issued personnel access door study

**Significant Planned Actions in the Next Six Months:**

- DOE approval of the RLD safety basis change package
- Complete installation of crane rails and supports in the canister decontamination cave
- Issue ETX system design description
- Begin full scale HEPA filter testing in accordance with the HEPA Filter Test Plan at the Mississippi State University facility
- Initiate high-level waste melter off gas treatment process/process vessel vent (HOP/PVV) design study

**Issues:**

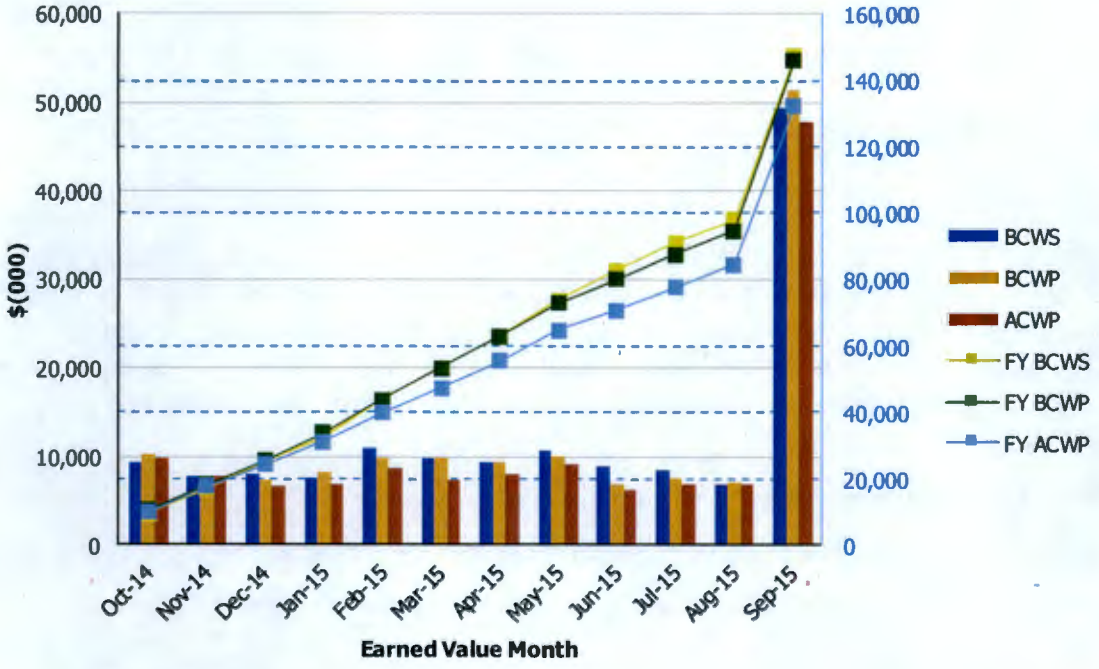
*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone. Technical issues related to the WTP include, among others, PJMs, corrosion/erosion in piping and vessels, hydrogen accumulation, criticality, and ventilation.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 2015

**River Protection Project**
**High-Level Waste Facility (WBS 1.03)**

EVMS Monthly and Fiscal Year Values




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $9,449 | $10,367 | $9,783 | 1.10 | 1.06 | $9,449 | $10,367 | $9,783 | 1.10 | 1.06 |
| Nov 2014 | $7,743 | $7,833 | $7,880 | 1.01 | 0.99 | $17,192 | $18,200 | $17,663 | 1.06 | 1.03 |
| Dec 2014 | $7,973 | $7,359 | $6,631 | 0.92 | 1.11 | $25,165 | $25,559 | $24,294 | 1.02 | 1.05 |
| Jan 2015 | $7,490 | $8,342 | $6,994 | 1.11 | 1.19 | $32,655 | $33,901 | $31,288 | 1.04 | 1.08 |
| Feb 2015 | $10,995 | $9,796 | $8,662 | 0.89 | 1.13 | $43,650 | $43,698 | $39,949 | 1.00 | 1.09 |
| Mar 2015 | $9,792 | $9,760 | $7,295 | 1.00 | 1.34 | $53,442 | $53,458 | $47,244 | 1.00 | 1.13 |
| Apr 2015 | $9,391 | $9,411 | $8,115 | 1.00 | 1.16 | $62,834 | $62,868 | $55,359 | 1.00 | 1.14 |
| May 2015 | $10,774 | $10,029 | $9,242 | 0.93 | 1.09 | $73,608 | $72,897 | $64,601 | 0.99 | 1.13 |
| Jun 2015 | $9,004 | $6,949 | $6,124 | 0.77 | 1.13 | $82,611 | $79,846 | $70,725 | 0.97 | 1.13 |
| Jul 2015 | $8,380 | $7,599 | $6,797 | 0.91 | 1.12 | $90,991 | $87,445 | $77,522 | 0.96 | 1.13 |
| Aug 2015 | $6,904 | $7,168 | $6,825 | 1.04 | 1.05 | $97,895 | $94,613 | $84,347 | 0.97 | 1.12 |
| Sep 2015 | $49,280 | $51,282 | $47,721 | 1.04 | 1.07 | $147,175 | $145,894 | $132,068 | 0.99 | 1.10 |
| PTD | $1,201,288 | $1,200,265 | $1,186,130 | 1.00 | 1.01 | | | | | |

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BCWS = budgeted cost of work scheduled.
BCWP = budgeted cost of work performed.
CPI = cost performance index.
EVMS = earned value management system.
FY = fiscal year.
SPI = schedule performance index.

## Low-Activity Waste Facility

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-07 | LAW Facility Construction Substantially Complete | 12/31/2014 | Past Due |
| D-00A-08 | Start LAW Facility Cold Commissioning | 12/31/2018 | Ongoing* |
| D-00A-09 | LAW Facility Hot Commissioning Complete | 12/31/2019 | Ongoing* |

LAW = low-activity waste.

The LAW Facility will process LAW that will be mixed with glass formers, vitrified into glass at a design capacity of 30 metric tons per day and placed in stainless steel containers anticipated to be disposed of on the Hanford Site in the Integrated Disposal Facility. As of September 2015, the LAW Facility was 53 percent complete overall, with engineering design 77 percent complete, procurement 75 percent complete, construction 77 percent complete, and startup and commissioning 4 percent complete.

**Significant Past Accomplishments:**

- Installed over 260 linear feet of process piping and hydro-tested 380 linear feet of piping
- Installed over 860 linear feet of conduit and pulled approximately 23,730 linear feet of cable
- Installed over 138 pen seals comprised of 29 conduit/steel, 92 spares, 16 pipe and 1 HVAC duct penetrations
- Completed melter 1 internal structural reinforcement welding
- Completed coating repairs on melter 1 structural steel

**Significant Planned Actions in the Next Six Months:**

- Complete subcontractor work scope in the annex
- Receive caustic scrubber
- Assemble and install wet electrostatic precipitator internals
- Receive the TCO and ammonia skid

**Issues:**

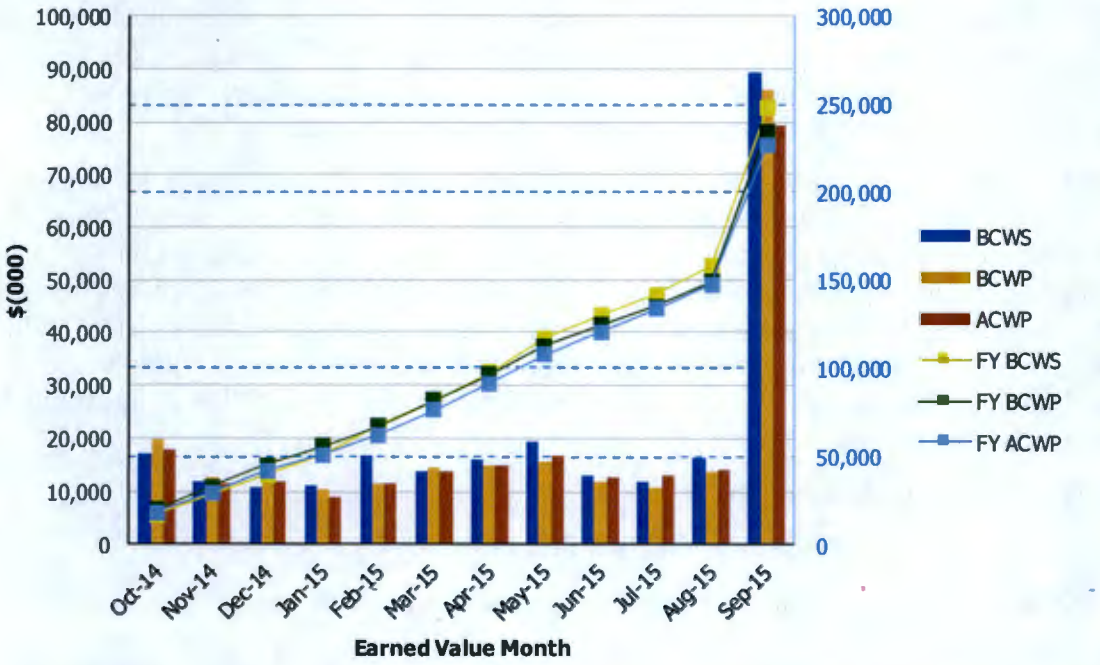
*DOE has notified the State of Washington and State of Oregon that a serious risk has arisen that DOE may be unable to meet this Consent Decree milestone.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 2015

**River Protection Project**
**Low-Activity Waste Facility (WBS 1.02)**

EVMS Monthly and Fiscal Year Values




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $16,994 | $19,896 | $17,781 | 1.17 | 1.12 | $16,994 | $19,896 | $17,781 | 1.17 | 1.12 |
| Nov 2014 | $11,700 | $12,666 | $11,597 | 1.08 | 1.09 | $28,694 | $32,562 | $29,378 | 1.13 | 1.11 |
| Dec 2014 | $10,760 | $12,499 | $11,927 | 1.16 | 1.05 | $39,454 | $45,061 | $41,305 | 1.14 | 1.09 |
| Jan 2015 | $11,248 | $10,387 | $9,033 | 0.92 | 1.15 | $50,702 | $55,448 | $50,338 | 1.09 | 1.10 |
| Feb 2015 | $16,654 | $11,341 | $11,676 | 0.68 | 0.97 | $67,356 | $66,789 | $62,014 | 0.99 | 1.08 |
| Mar 2015 | $13,681 | $14,539 | $13,778 | 1.06 | 1.06 | $81,037 | $81,329 | $75,792 | 1.00 | 1.07 |
| Apr 2015 | $16,031 | $14,925 | $15,002 | 0.93 | 0.99 | $97,068 | $96,254 | $90,794 | 0.99 | 1.06 |
| May 2015 | $19,533 | $15,802 | $16,674 | 0.81 | 0.95 | $116,601 | $112,056 | $107,468 | 0.96 | 1.04 |
| Jun 2015 | $12,899 | $11,881 | $12,626 | 0.92 | 0.94 | $129,500 | $123,936 | $120,094 | 0.96 | 1.03 |
| Jul 2015 | $12,044 | $10,770 | $12,910 | 0.89 | 0.83 | $141,543 | $134,707 | $133,004 | 0.95 | 1.01 |
| Aug 2015 | $16,309 | $13,852 | $13,987 | 0.85 | 0.99 | $157,853 | $148,558 | $146,991 | 0.94 | 1.01 |
| Sep 2015 | $89,562 | $86,107 | $79,465 | 0.96 | 1.08 | $247,414 | $234,665 | $226,456 | 0.95 | 1.04 |
| PTD | $1,218,199 | $1,208,256 | $1,201,489 | 0.99 | 1.01 | | | | | |

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## Balance of Facilities

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-12 | Steam Plant Construction Complete | 12/31/2012 | Complete |

The BOF will provide services and utilities to support operation of the main production facilities: PT, HLW, LAW, and LAB. As of September 2015, BOF was 55 percent complete overall, with engineering design 80 percent complete, procurement 71 percent complete, construction 80 percent complete, and startup and commissioning 14 percent complete.

Engineering activities are in progress to develop the preliminary design for BOF systems in support of DFLAW. Current efforts are focused on progressing the design of the Effluent Management Facility (EMF), defining the required BOF system isolations, preparing procurements, and initiating the Preliminary Design Safety Analysis (PDSA) process for EMF. Construction efforts are focused on initiation of BOF system isolations and completion of the remaining punch list items required to support turnover of all major systems within the Nonradioactive Liquid Waste Disposal Facility, WTP switchgear, and BOF switchgear buildings for component level testing.

**Significant Past Accomplishments:**

- Completed multi-discipline review of EMF design
- Continued excavation and drilling activities to install cathodic protection system upgrades
- Issued the DFLAW Basis of Design Change Notice (BODCN)
- Continued switchgear testing in support of site energization

**Significant Planned Actions in the Next Six Months:**

- Complete EMF PDSA
- Begin excavation for EMF
- Complete site energization from permanent power supply

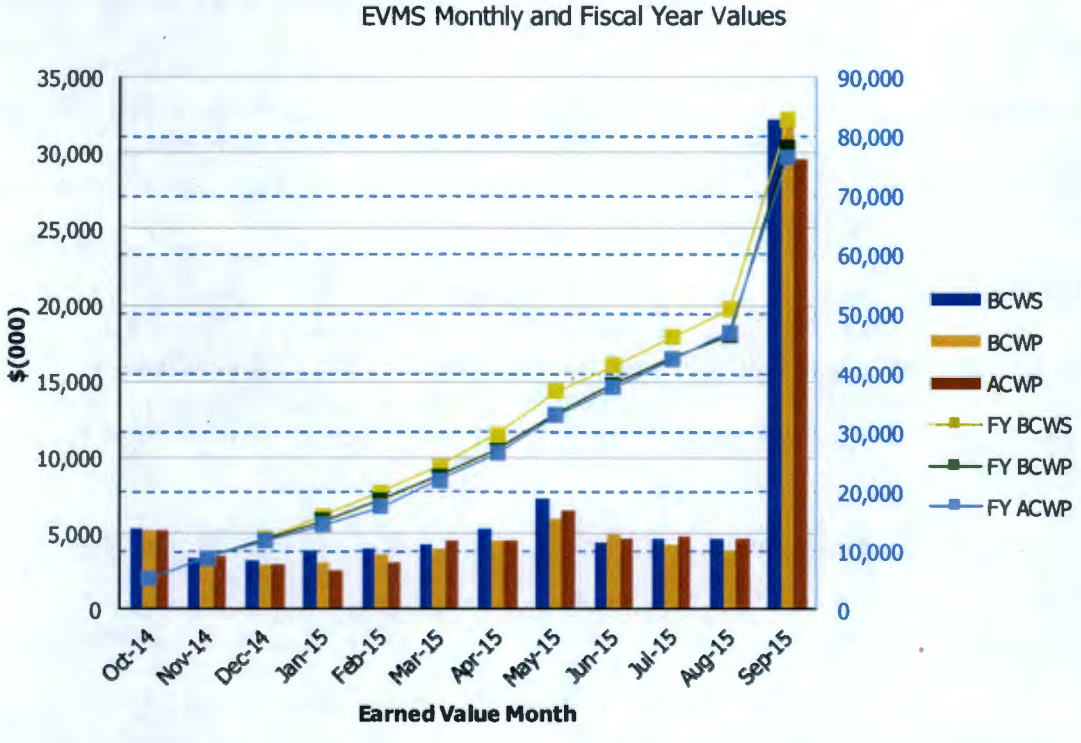
**Issues:**

No major issues at this time.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 2015

**River Protection Project**
**Balance of Facilities (WBS 1.05)**




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $5,300 | $5,238 | $5,223 | 0.99 | 1.00 | $5,300 | $5,238 | $5,223 | 0.99 | 1.00 |
| Nov 2014 | $3,429 | $3,578 | $3,454 | 1.04 | 1.04 | $8,729 | $8,816 | $8,677 | 1.01 | 1.02 |
| Dec 2014 | $3,240 | $3,023 | $2,976 | 0.93 | 1.02 | $11,969 | $11,839 | $11,653 | 0.99 | 1.02 |
| Jan 2015 | $3,885 | $3,098 | $2,584 | 0.80 | 1.20 | $15,854 | $14,937 | $14,237 | 0.94 | 1.05 |
| Feb 2015 | $4,074 | $3,578 | $3,151 | 0.88 | 1.14 | $19,928 | $18,515 | $17,388 | 0.93 | 1.06 |
| Mar 2015 | $4,270 | $4,016 | $4,491 | 0.94 | 0.89 | $24,198 | $22,531 | $21,879 | 0.93 | 1.03 |
| Apr 2015 | $5,384 | $4,497 | $4,491 | 0.84 | 1.00 | $29,582 | $27,029 | $26,370 | 0.91 | 1.02 |
| May 2015 | $7,347 | $6,027 | $6,470 | 0.82 | 0.93 | $36,930 | $33,056 | $32,841 | 0.90 | 1.01 |
| Jun 2015 | $4,403 | $4,990 | $4,649 | 1.13 | 1.07 | $41,333 | $38,046 | $37,489 | 0.92 | 1.01 |
| Jul 2015 | $4,638 | $4,339 | $4,769 | 0.94 | 0.91 | $45,971 | $42,386 | $42,259 | 0.92 | 1.00 |
| Aug 2015 | $4,690 | $3,880 | $4,646 | 0.83 | 0.84 | $50,661 | $46,265 | $46,905 | 0.91 | 0.99 |
| Sep 2015 | $32,167 | $31,837 | $29,588 | 0.99 | 1.08 | $82,828 | $78,103 | $76,493 | 0.94 | 1.02 |
| PTD | $429,495 | $425,201 | $423,623 | 0.99 | 1.00 | | | | | |

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## Analytical Laboratory

| Number | Title | Due Date | Status |
|---|---|---|---|
| D-00A-05 | LAB Construction Substantially Complete | 12/31/2012 | Complete |

LAB = Analytical Laboratory.

The LAB will support WTP operations by analyzing feed, vitrified waste, and effluent streams. As of September 2015, the LAB was 60 percent complete overall, with engineering design 82 percent complete, procurement 86 percent complete, construction 96 percent complete, and startup and commissioning 10 percent complete.

During this reporting period engineering efforts are focused on LAB system reviews to evaluate potential modifications or isolations in support of the direct feed of LAW. Closure of nonconformance reports and construction deficiency reports continued. Construction efforts within the LAB are minimal. The remaining construction work scope will be completed in parallel with system modifications and construction activities required to support the direct feed of LAW.

**Significant Past Accomplishments:**

- Continued development of the test engineers workstation
- Continued development of procedures for the WTP analytical methods development process

**Significant Planned Actions in the Next Six Months:**

- Initiate component level testing of select LAB systems
- Complete LAB system walk downs in support of DFLAW modifications

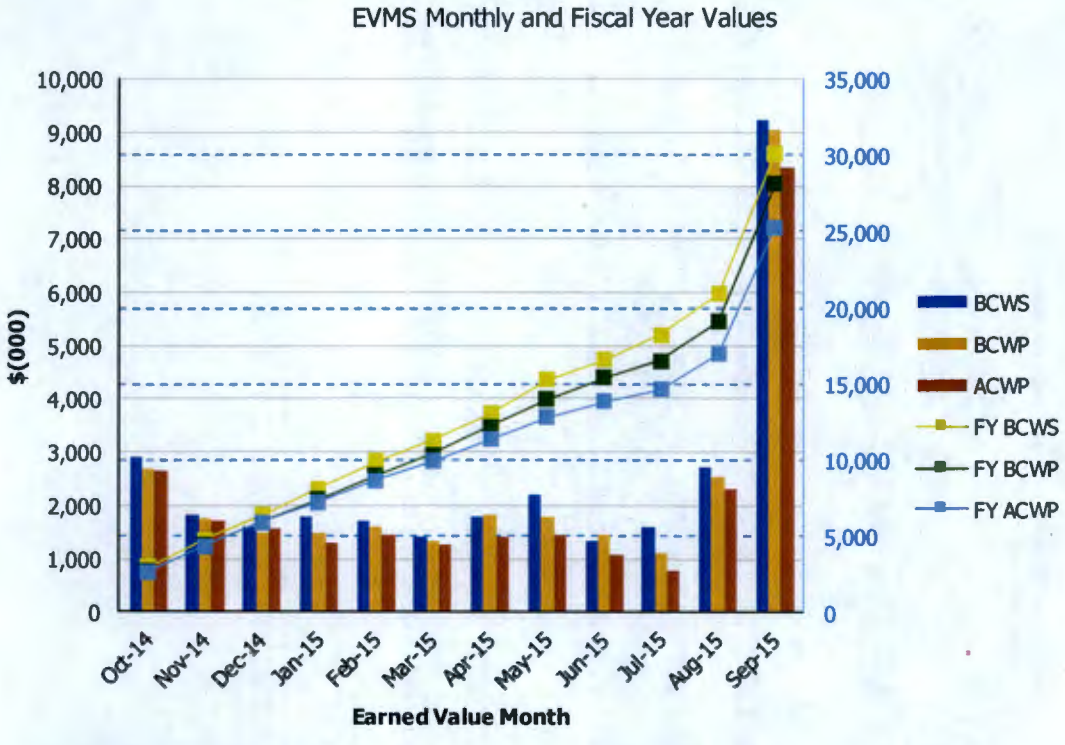
**Issues:**

No major issues at this time.

## EXC-01a: Fiscal Year Cost and Schedule Report

Data Set: FY 2015 Earned Value Data Data as of: September 2015

**River Protection Project**
**Analytical Laboratory (WBS 1.06)**




| Earned Value Month | BCWS | BCWP | ACWP | SPI | CPI | FY BCWS | FY BCWP | FY ACWP | FY SPI | FY CPI |
|---|---|---|---|---|---|---|---|---|---|---|
| Oct 2014 | $2,920 | $2,670 | $2,645 | 0.91 | 1.01 | $2,920 | $2,670 | $2,645 | 0.91 | 1.01 |
| Nov 2014 | $1,827 | $1,748 | $1,695 | 0.96 | 1.03 | $4,747 | $4,418 | $4,340 | 0.93 | 1.02 |
| Dec 2014 | $1,614 | $1,482 | $1,552 | 0.92 | 0.95 | $6,361 | $5,900 | $5,892 | 0.93 | 1.00 |
| Jan 2015 | $1,788 | $1,490 | $1,304 | 0.83 | 1.14 | $8,149 | $7,390 | $7,196 | 0.91 | 1.03 |
| Feb 2015 | $1,716 | $1,618 | $1,447 | 0.94 | 1.12 | $9,865 | $9,008 | $8,643 | 0.91 | 1.04 |
| Mar 2015 | $1,413 | $1,322 | $1,266 | 0.94 | 1.04 | $11,278 | $10,330 | $9,909 | 0.92 | 1.04 |
| Apr 2015 | $1,781 | $1,833 | $1,407 | 1.03 | 1.30 | $13,059 | $12,163 | $11,316 | 0.93 | 1.07 |
| May 2015 | $2,186 | $1,773 | $1,459 | 0.81 | 1.21 | $15,245 | $13,936 | $12,775 | 0.91 | 1.09 |
| Jun 2015 | $1,338 | $1,453 | $1,077 | 1.09 | 1.35 | $16,584 | $15,390 | $13,852 | 0.93 | 1.11 |
| Jul 2015 | $1,608 | $1,130 | $777 | 0.70 | 1.45 | $18,192 | $16,520 | $14,629 | 0.91 | 1.13 |
| Aug 2015 | $2,730 | $2,534 | $2,323 | 0.93 | 1.09 | $20,922 | $19,054 | $16,952 | 0.91 | 1.12 |
| Sep 2015 | $9,230 | $9,036 | $8,343 | 0.98 | 1.08 | $30,152 | $28,090 | $25,295 | 0.93 | 1.11 |
| PTD | $312,565 | $310,919 | $308,349 | 0.99 | 1.01 | | | | | |

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# Waste Treatment Plant Project Percent Complete Status (Table)

**Waste Treatment Plant Project - (LBL/Project Services) Percent Complete Status**

**Through September 2015**

| (Dollars - Millions) | Overall Facility Percent Complete Unallocated Dollars | | | Design/Engineering Unallocated Dollars | | | Procurement Unallocated Dollars | | | Construction Unallocated Dollars | | | Startup & Plant Operations Unallocated Dollars | | | Project Management & Shared Services Unallocated Dollars | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Facilities | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete | Performance Measurement Baseline (PMB) | Budgeted Cost of Work Performed (BCWP) | % Complete |
| Low-Activity Waste | 2,124.0 | 1,133.3 | 53% | 473.6 | 364.3 | 77% | 341.3 | 254.4 | 75% | 627.4 | 482.3 | 77% | 677.6 | 28.2 | 4% | 4.0 | 4.0 | 100% |
| Balance of Facilities | 720.3 | 397.5 | 55% | 132.8 | 106.7 | 80% | 75.9 | 53.8 | 71% | 248.4 | 199.3 | 80% | 262.7 | 37.2 | 14% | 0.5 | 0.5 | 100% |
| Analytical Lab | 507.2 | 303.0 | 60% | 94.5 | 77.8 | 82% | 65.7 | 56.8 | 86% | 155.8 | 149.1 | 96% | 190.7 | 18.8 | 10% | 0.5 | 0.5 | 100% |
| LBL Facility Services | 438.3 | 57.8 | 13% | 0.0 | 0.0 | 0% | 42.6 | 10.2 | 24% | 31.4 | 5.3 | 17% | 241.7 | 20.3 | 8% | 122.6 | 22.12 | 18% |
| **Total LBL** | 3,789.8 | 1,891.5 | 50% | 700.9 | 548.8 | 78% | 525.6 | 375.2 | 71% | 1,063.1 | 835.9 | 79% | 1,372.7 | 104.5 | 8% | 127.6 | 27.1 | 21% |
| Direct Feed LAW | 89.3 | 18.0 | 20% | 61.6 | 16.5 | 27% | 7.48 | 0.00 | 0% | 15.6 | 0.5 | 3% | 0.0 | 0.0 | 0% | 4.6 | 0.93 | 20% |
| Project Services | 363.5 | 206.6 | 57% | 54.0 | 26.7 | 49% | 34.9 | 18.4 | 53% | 71.0 | 54.0 | 76% | 1.7 | 1.7 | 100% | 201.8 | 105.9 | 52% |
| **Total DFLAW & PS** | 452.7 | 224.6 | 50% | 115.6 | 43.2 | 37% | 42.4 | 18.4 | 43% | 86.6 | 54.5 | 63% | 1.7 | 1.7 | 100% | 206.4 | 106.8 | 52% |
| **Total LBL, DFLAW & Project Services** | 4,242.6 | 2,116.1 | 50% | 816.6 | 592.1 | 73% | 568.0 | 393.6 | 69% | 1,149.6 | 890.4 | 77% | 1,374.4 | 106.2 | 8% | 334.0 | 133.9 | 40% |
| **PT/HLW/SS Percent Complete Status Frozen as of September 2012 (due to project rebaselining efforts)** | | | | | | | | | | | | | | | | | | |
| High-Level Waste | 1,478.6 | 922.1 | 62% | 364.4 | 325.2 | 89% | 433.9 | 349.4 | 81% | 561.1 | 243.2 | 43% | 119.2 | 4.4 | 4% | n/a | n/a | n/a |
| Pretreatment | 2,517.3 | 1,410.5 | 56% | 761.7 | 645.8 | 85% | 679.9 | 380.4 | 56% | 890.0 | 378.6 | 43% | 185.8 | 5.6 | 3% | n/a | n/a | n/a |
| Shared Services | 4,726.9 | 3,632.6 | 77% | 1,047.0 | 977.9 | 93% | 451.7 | 395.0 | 87% | 1,436.5 | 1,143.0 | 80% | 453.5 | 133.2 | 29% | 1,338.1 | 983.5 | 73% |
| **Total HLW/PT/SS** | 8,722.8 | 5,965.2 | 68% | 2,173.1 | 1,948.9 | 90% | 1,565.5 | 1,124.8 | 72% | 2,887.6 | 1,764.8 | 61% | 758.5 | 143.2 | 19% | 1,338.1 | 983.5 | 73% |
| Undistributed Budget | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a | n/a |
| **Total WTP** | 12,965.4 | 8,081.3 | 62% | 2,989.7 | 2,541.0 | 85% | 2,133.5 | 1,518.4 | 71% | 4,037.2 | 2,655.2 | 66% | 2,132.9 | 249.4 | 12% | 1,672.1 | 1,117.4 | 67% |

Source: Preliminary WTP Contract Performance Report - Format 1, Data for September 2015

*Note: In September 2012, the LBL Replan was incorporated into the project OTB baseline resulting in increases/decreases to the LBL facility budgets, which correspondingly increased/decreased the facility/function to-date percent complete values. In October 2012, the PT/HLW/SS Interim Work Plan was incorporated into the project OTB baseline resulting in decreases to the PT/HLW/SS facility budgets, this was due to a work scope shift from the Distributed budget to UB. Percent Complete Values shown for PT, HLW and SS have been frozen with the September 2012 values due to the Interim Work Plan and budgets being moved into UB. UB value for the project for PT/HLW/SS is $2,014M. The percent complete values for the Total WTP are the current total LBL BCWP added to the frozen HLW/PT/SS BCWP values. In March 2014, Project Controls and Project Management work scope was moved out of Shared Services control accounts into the facilities with new control accounts being set up in the facilities. These will now be seen under Project Management/Shared Services by facility. The Shared Services PMB value has not been changed to reflect this change due to the freeze on HLW/PT and SS and the budgets remaining in UB. October 2014 data reflects the incorporation of Direct Feed LAW and the split of Shared Services into LBL Facility Services and Project Services. July 2015 LBL percent complete data is a total of LAW-BOF-LAB and LBL Facility Services. The Project Services Allocation account (zPSA), as shown on the CPR Format 1, is not added to LBL for percent complete purposes.*